

THREE NEW GENERA OF APTEROUS ARADIDÆ

(Hemiptera)

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The recent discovery of apterous Aradidæ of the genus *Chelonocoris* Miller* was a most remarkable advance in our concept of this group of insects. Localized geographically and exhibiting such remarkable characters, it was unhesitatingly made the type of a new subfamily, Chelonocorinæ. Now we find that a new genus, *Notoplocoris*, disrupts the geographical picture and a new genus, *Emydocoris*, destroys any structural homogeneity which the Chelonocorinæ may once have had. The nymphs of *Notoplocoris*, furthermore, link this form with typical Mezirinæ. Indeed, the genus *Barcinus* Stål, with long first antennal segment, strongly produced juga, and laterally located eighth segment stigmata, suggests a possible direct ancestor for *Chelonocoris* and *Phyllotingis* Walker suggests such an ancestral form for the American *Notoplocoris*. *Emydocoris* was very likely derived by aptery from a *Mezira*-like ancestor. Thus a polyphyletic origin of the apterous Aradidæ is indicated and the subfamily Chelonocorinæ is no longer tenable.

The present case throws light on the general problem of pterygopolymorphism in the Heteroptera. The Aradidæ are now known to exhibit brachyptery (*Mezira*, *Aradus*), stenoptery (*Aradus*) and aptery (*Chelonocoris*, *Notoplocoris*, *Emydocoris*, *Chelonoderus*). Such phenomena are commonplace in the Gerridæ and Veliidæ and are accompanied by equally remarkable structural modifications, particularly those correlated with wing development, e.g. thoracic modifications. Although a few Veliidæ and Gerridæ (*Trochopus*, *Halovelis* and *Halobates*) are permanently apterous, many others exhibit all degrees from macroptery to aptery within a single population.

The modern conception of hormone control of development suggests that apterous forms which retain many nymphal structures but which have fully developed reproductive organs may represent cases of arrested or retarded development of one set of organs. This is certainly less remarkable than the complete

* Miller, N. C. E. 1938. A new subfamily of Malaysian Dysodiidæ. Ann. Mag. Nat. Hist. (11) 1:498-510, 7 figs.

neoteny exhibited by larviform females of Lampyridæ or the pædogenesis which occurs in *Micromalthus*, the Cecidomyidæ, and in a few other groups.

KEY TO THE APTEROUS GENERA OF MEZIRINÆ
(CHELONOCORINÆ Miller)

1. Pronotum narrow, gradually constricted anteriorly where it is narrower than head. First antennal segment as long or longer than head. Antenniferous tubercles scarcely produced. Oriental*Chelonocoris* Miller
- Pronotum with well developed antero-lateral angles across which it is broader than head. First antennal segment shorter than head. Antenniferous tubercles well developed.....2
2. Head subquadrate, with large subangular lobes behind the eyes. Body surface entirely naked. Connexival segments not produced, even on seventh segment. Neotropical..*Emydocoris*, n. gen.
- Head subtriangular, strongly narrowed behind the eyes. Body surface at least partially clothed with short, thick, appressed hairs. Connexival segments briefly arcuate posteriorly, the sixth and seventh segments more strongly produced into distinct lobes3
3. Juga slender, subparallel, subacute at apices, not reaching middle of first antennal segment. Metanotum produced laterad as a plate-like cover over base of connexivum. Neotropical.*Notoplocoris*, n. gen.
- Juga broad, dilated anteriorly, and feebly, obliquely emarginate at apices, reaching nearly to apex of first antennal segment. Metanotum confined within narrow connexival plates, not reaching lateral margins. Australian.....*Chelonoderus*, n. gen.

Notoplocoris Usinger, new genus

Apterous, subtriangular in form, and irregularly clothed with erect or subappressed thick hairs. *Head* slightly longer than broad, strongly narrowed basally, without postocular spines; antenniferous tubercles prominent, divergent, acute; anterior portion of head reaching almost to middle of first antennal segment, the juga surpassing tylus by one-half their length, produced straight forward and tapering apically, forming a deep cleft between. *Antennæ* a little shorter than head and thorax combined, the first segment long, curved outward, stout, sparsely clothed with erect hairs, second segment slender, cylindrical and nude, half as long as first, third slender, cylindrical and wide, slightly longer than first, fourth shortest, pyriform, densely pilose on apical third. *Rostrum* not reaching base of head. *Pronotum* half again as wide as head across eyes, the sides roundly lobulate; meso and metanota progressively wider, produced laterally as rounded or subangulate lobes. Metasternal orifice channels visible from above between

meso and metanota. Meso and metanota without trace of wing pads, triangular scutellum absent. Trochanters distinctly separated from femora. *Abdomen* entirely exposed above, the terga forming a regular pattern of granules and plates. Connexival segments sinuate on their basal halves, briefly arcuately expanded on posterior halves, those of seventh segment produced as short, divergent lobes, rounded at apices, on either side of genital segment. Stigmata of all segments except eighth (genital lobes) located remote from lateral margins, genital lobes with stigmata placed on the sides and visible from above. Abdomen with sides concave to expanded seventh segment in male, oval in outline and broadest across sixth segment in female.

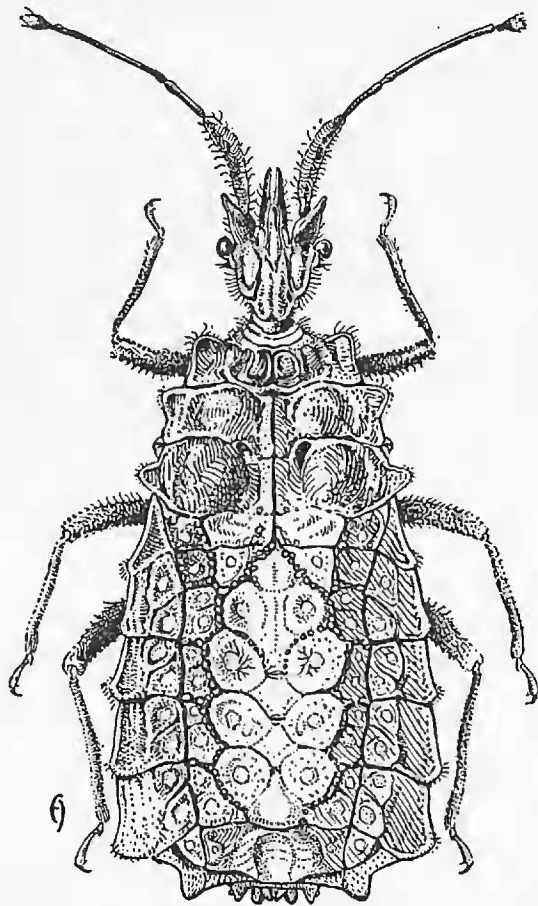


Figure 1. *Notoplocoris montei* Usinger, n. gen. and sp., female allotype.

Genotype: *Notoplocoris montei* Usinger, n. sp.

Suggestive of the Malay genus *Chelonocoris* Miller because of the apterous condition and plate-like pattern of the abdominal tergites. *Chelonocoris* differs in possessing relatively longer first antennal segments; a less deeply cleft apical process of head; shorter antenniferous tubercles; broader base of head with pronotum but little wider than head anteriorly and evenly widening posteriorly, without rounded lateral lobes on each thoracic segment; scuteller area rather distinctly indicated as a poste-

riorly produced triangular plate; connexival segments not roundly lobulate on their posterior halves, the seventh abdominal segment produced on either side of genital segments into long, rounded or subacute lobes; trochanters partially fused with the femora.

Notoplocoris montei Usinger, new species

(Figure 1)

Male. *Head*, one-fourth longer than broad across eyes, 50::39; apical process comprising about two-fifths of entire head length, the tylus extending about half of this distance, juga produced beyond apex of tylus for one-fifth of total length of head; juga tapering apically, their inner margins subparallel, forming a deep, narrow cleft; antenniferous tubercles very prominent, arising about at middle of head just in front of eyes and separated from apical process of head almost from their bases by deep clefts, broad on basal two-thirds, more attenuated and divergent on apical third beyond insertion of antennæ; eyes globular, small but strongly exerted, about one-sixth as wide as interocular space, 5::28; head strongly narrowed behind eyes, briefly angular immediately behind eyes, arcuately converging toward the middle of postocular region, less than half the width across eyes and subparallel at basal fifth, with a narrow, finely granular, constricted neck region at extreme base; upper surface roughened and polished except for a large smooth area laterally behind eyes; tylus moderately elevated, head with a broadly elevated median area, separated by ill defined depressions from lateral areas which are continuous with antenniferous tubercles and bear the eyes and antennæ; under surface convex, the under sides of antenniferous tubercles bulbous behind insertions of antennæ, apical process beneath tylus strongly convex; pubescence unevenly erect or subappressed except for smooth sublateral areas behind eyes, the lateral margins behind eyes with hairs on subangular prominence and two rows of closely placed hairs behind this. *Rostrum* inserted a little in front of middle and inside of a narrow slit in a strongly produced lobe; this apparently bilobed hood decreasing in elevation posteriorly to form the longitudinal carinæ of the rostral groove which join just before base of head; large, oblique wrinkles on either side of rostral groove; rostrum scarcely reaching end of rostral groove, its first segment very slender and located within the narrow cleft described above; terminal segments broader. *Antennæ* twice as long as head; proportion of segments one to four as 35:18:37:10; first segment seven-tenths as long as head, about half as thick as front femora, slightly narrowed basally, curved outward, beset with erect, stiff hairs; second and third segments about half as thick as first, cylindrical, with very short, sparse, appressed hairs.

Thorax subflattened above, the sutures between segments ill-defined. *Pronotum* on anterior two-fifths with two ring-like areas which bear dense erect hairs along their sides; widening abruptly posterior to this to one-fourth broader than head across eyes, the rounded lateral lobes a little elevated, bearing two rows of erect hairs along their edges anteriorly and numerous shorter hairs posteriorly; disk behind ring-like elevations with a narrow but deep impression longitudinally at middle, with posteriorly divergent elevated carinæ on either side of middle and irregular sublateral carinæ beyond subdepressed areas; posterior margin straight laterally, moderately convex medially. *Mesonotum* almost half again as broad across lateral lobes as across pronotal lobes, 75::55; lobes subroundly produced anteriorly, narrowed posteriorly; disk with a feebly developed median longitudinal elevation which is finely impressed along its middle; disk moderately elevated laterally at middle and strongly depressed into a broad deep pit on either side of middle at posterior margin and extending onto metanotum; posterior margin ill-defined at middle a little behind these impressions, then turning forward through the pits and extending as a concave arch to lateral margin at ostiolar cleft. *Metanotum* short, about half as long on median line as mesonotum, produced laterally as a narrow, plate-like lobe with rounded apex, the width across these lobes one-fourth greater than greatest width of mesonotum; metanotal disk with a finely impressed line along middle, feebly depressed on either side of middle behind deep anterior pits and broadly convex sublaterally; posterior margin very ill-defined, transverse at center, concavely sinuate on either side of middle and broadly convex sublaterally. *Ostiolar canals* produced outward as short, rounded lobes on either side between meso and metanota.

Abdomen with first segment visible only from above, practically fused with metanotum anteriorly, about as long as metanotum on median line and traversed by a continuation of the finely impressed longitudinal thoracic line; disk elevated at middle and sublaterally, with a subtriangular plate on either side cut off from abdominal margin by the connexival plate of second abdominal segment; broad, transverse areas on either side of middle bounded medially and anteriorly by low, rounded tubercles which are irregularly spaced. Main disk of abdomen sharply divided sublaterally by a deeply impressed suture into a broad lateral connexival area and the central abdominal tergum which is about three times as wide as connexivum. Connexival margins feebly concave on anterior portion of each segment, briefly, roundly produced on posterior fourth into small rounded lobes which increase in size from anterior to posterior segments and each of which bears a tuft of thick pale hairs. Sixth connexival segment strongly produced, the distance across expanded, angulately rounded lobes one-eighth greater

than greatest width across metathorax. Seventh connexival margin more narrowly produced, the lobes produced postero-laterally on either side of genital segments and rounded apically, not reaching level of tip of genital segments. Disk of each connexival segment except the subtriangular second segment, divided into an outer homogeneous half which is subdepressed posteriorly, and an inner half which is further subdivided by an oblique impressed line into two subtriangular areas, each with a paler, smooth rounded area at its center. Most of connexivum with short, subappressed hairs but with a tuft of longer, suberect hairs at middle of posterior margin of segments III to VI. Tergal plates likewise further subdivided, segments two to seven each with a pair of lateral smooth areas opposite those of connexival segments, each pair of cells slightly depressed, bounded along their inner margins by rows of rounded tubercles and each cell with a pale round spot at center. Central areas of tergites delimited by sutures or rows of tubercles or both and bearing a rounded smooth area at the middle of each side. Second segment composed of two subtriangular plates, one on either side of the anteriorly produced third segment which is broadly joined to first segment at middle. Third segment nearly half again as long as broad, very feebly longitudinally impressed along middle of anterior half, bounded along anterior and lateral margins by rounded tubercles, depressed a little behind middle and elevated at narrow transversely rugose posterior margin where the first dorsal abdominal scent gland opening is present. Fourth segment deeply emarginate anteriorly to receive the posteriorly produced third segment, roundly arcuate and bounded by tubercles laterally, slightly less strongly produced backwards than third segment, the narrow posterior tip finely transversely rugose and bearing the second scent gland at its apex. Disk on either side of produced third segment slightly depressed and bearing numerous long, subappressed hairs. Fifth segment likewise deeply notched for the reception of the posterior projection of fourth segment, subrounded and bounded laterally by rounded tubercles, posterior margin less strongly and more narrowly produced and slightly raised apically at middle at the third abdominal scent gland. Sixth segment nearly straight along posterior margin. Seventh segment strongly elevated and broadly concave at middle. First genital segment ring-like but longest at middle, produced on either side of second genital segment as knob-like genital lobes which do not reach level of apex of second segment. Second genital segment strongly convex, subrounded posteriorly with a broad, attenuated process dorsally which is curved downward apically. Genital segments and areas adjoining, clothed with thick pale hairs.

Under surface sparsely clothed with short, subappressed, pale hairs with a series of longitudinal subtriangular or oval smooth

areas along middle, one each on mesosternum, metasternum, and abdominal segments one to six. Abdomen with three rows of smooth round areas, the outermost row on ventral portion of connexivum. Spiracles of all but the eighth segment ventral, located about half way between sublateral longitudinal suture and lateral margin. Spiracles of eighth segment located laterally on the edges of strap-like posterior processes. Trochanters distinct. Femora moderately incrassate, without stout spines or processes. Legs clothed with erect or subappressed, thick pale hairs.

Color generally brown with ferruginous disk-like areas, rostrum, trochanters, and ostiolar grooves, fulvous tarsi and testaceous pubescence.

Female. Similar to male but with the abdomen broader, the connexival margins forming an oval outline in contrast to the concave outline with posterior dilation of the male. Female abdomen widest across dilated portions of fifth segment, nearly as wide at this level as long. Sixth abdominal tergite strongly elevated at middle of posterior half, seventh tergite broadly elevated at middle with an arcuately rugose depression in the elevated area. Seventh segment produced postero-laterally on either side of genital segments as apically rounded lobes which do not attain level of apices of genital segments. First genital segment produced on either side of median process as subacute lobes, each bearing a spiracle on its outer edge which is visible from above. Median process reaching about to level of lobes of first genital segment, the genital valves slightly exceeding central oviduct.

Size: male, length 10.3, width (abdomen) 4.6 mm.; female, length 12 mm., width (abdomen) 5.5 mm.

Holotype, male, No. 5222, Calif. Acad. Sci., Ent., allotype, female, No. 5223, Calif. Acad. Sci., Ent., and one male and one female paratype, Angra, Estado Rio de Janeiro, Jussara, October, 1935 (L. Travassos et Lopes).

Two nymphs of indeterminate instar are 8½ and 9 mm. in length and 4 mm. wide. They are very similar to nymphs of the genus *Mezira*, differing chiefly in the different antennal proportions (as described above for the adults), strongly produced juga, lack of mesonotal and metanotal wing pads, and lateral position of the spiracles of eighth abdominal segment. Most significant similarities to *Mezira* are the presence of postocular spines (absent in adult *Notoplocoris*) and nearly identical arrangement of thoracic and abdominal plates and depressed areas into a pattern which appears to be basic for the Mezirinae and which is certainly the precursor of the arrangement seen in adult *Notoplocoris*.

Emydocoris Usinger, new genus

Apterous, elongate-oval in form, convex below with a complicated pattern of pits and elevations above; surface in great part naked. Head subquadrate, as long as wide across the eyes, with sides subparallel, eyes only slightly protruding. Anterior portion of head relatively short, about one-third of total head length, juga surpassing tylus and contiguous beyond it, moderately dilated apically. Antenniferous tubercles relatively short, extending only about one-third the length of median portion of head, scarcely dilated apically, the outer side nearly parallel. Eyes longer than broad. Postocular portion of head dilated into thick lobules which complete the subquadrate outline. Rostrum short, not reaching posterior limits of deep rostral sulcus. Antennæ short, one-third longer than head, the first segment thickest, curved outward, second segment a little enlarged apically, shortest, one-third shorter than first, third segment longest, cylindrical, half again as long as first, fourth segment a little shorter than first, with a pyriform shape due to the great thickening subapically, densely pubescent apically.

Pronotum about three times as broad as head, strongly, roundly elevated at sides, narrowed to a depressed collar anteriorly, not produced laterally into lobes. Mesonotum short and roundly elevated laterally but scarcely produced laterally over ostiolar canals. Metanotum not reaching lateral margins, fused posteriorly with first abdominal segment. Meso and metanotal disks deeply pitted laterally, without trace of wing pads and without triangular scutellum. Trochanters distinctly separated from femora.

Abdomen entirely exposed above, elevated medially, depressed and lobulate sub-laterally, the broad connexival margins elevated laterally, the margins feebly rounded forming the subrounded contours of abdomen which are uninterrupted by lobes or processes except for genitalia. Stigmata of all but eighth abdominal segment located remote from lateral margins at or near the middle of their respective segments. Spiracles of eighth segment (genital lobes) located postero-laterally on the short lobes.

Genotype: *Emydocoris testudinatus* Usinger, n. sp.

Suggestive of *Mezira* in shape of anterior portion of head, antennæ, location of abdominal spiracles, and in female genitalia. Differing in the absence of postocular spines and in the apterous condition and remarkable arrangement of plates dorsally. *Emydocoris* differs from the other apterous Aradidæ thus far described in the subquadrate head with broad postocular

portion and in its non-lobulate thoracic and connexival angles and its glabrous body surface.

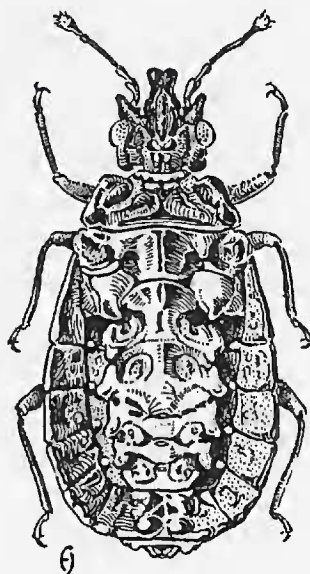


Figure 2. *Emydocoris testudinatus* Usinger, n. gen. and sp., female holotype.

Emydocoris testudinatus Usinger, new species

Female. *Head* slightly longer than broad across eyes, 37::34; apical process comprising about one-third of entire head length, the tylus extending only about half this distance, the juga contiguous beyond this, dilated into large rounded lobes apically; antenniferous tubercles short, the distance from front margin of an eye to apex of antenniferous tubercle equal to length of an eye; tubercles feebly anteriorly divergent and blunt at apices; eyes suboval, about two-thirds as broad as long, extending about one-third of their width beyond sides of head, about one-third as wide as interocular space, 7::20; postocular portion of head broad, the postero-lateral lobes depressed sublaterally, thickened laterally, the posterior angles subrounded, nearly touching pronotal collar. *Antennæ* slightly longer than head, 42::37; proportion of segments one to four as 10:8:14:10. *Rostrum* very short, less than half as long as head, 17::37; proportion of segments one to four as 2:3:5:7; rostral groove narrow and swollen anteriorly at base of rostrum, broad and very deep behind base, the strongly elevated sides of trough continuing around posterior end to completely enclose trough.

Pronotum two and one-half times as broad as long, 52::20; widest posteriorly, the sides thickly rounded and strongly elevated, antero-lateral angles broadly rounded, depressed toward the middle, anterior margin depressed and forming a smooth collar; disk

with an oblique rounded carina sublaterally near each antero-lateral angle, then with a deep collar to just within postero-lateral angles; with a broad oblique elevation on either side of middle, terminated by a small transverse carina just before collar and separated by a very deep median suture or fossa which widens and becomes shallower posteriorly to feebly elevated posterior margin. *Mesonotum* three times as broad as long, 60::18; longest at middle where it is nearly as long as pronotum, 18::19; disk briefly roundly elevated laterally over ostiolar canals, with a deep oblique pit on either side of middle, the sides of pit produced on either side as rounded tubercles with apices subcontiguous; middle of disk strongly elevated and feebly, longitudinally impressed; posterior margin strongly sinuate, straight at middle, bent strongly forward and then outward behind pits, and then again curved forward sublaterally just before connexivum. *Metanotum* fused with first abdominal segment.

Abdomen with disk separated into the usual connexival, subconnexival, discomarginal, and discal areas, the entire disk elevated along middle and depressed sublaterally along sutures which separate connexivum from disk; connexivum of first and second segments fused, very long, extending forward to lateral lobes of mesonotum; connexival segments with long, shallow depressions sublaterally, the third to sixth segments with ill-defined plate-like areas on inner half; disk of abdomen with a deep oblique pit laterally at base on either side of metanotum, the anterior and posterior margins of each pit roundly produced and nearly contiguous; marginal discal area of third to sixth segments depressed in the form of ovals, the posterior margins of third to fifth segments with an inner and outer tubercle converging with their apices nearly contiguous behind each depressed area; third segment longest, as long at middle as the remaining segments of disk, with a rounded depression either side of middle on basal half; apex of third segment transversely wrinkled, fourth and fifth segments much shorter, likewise transversely wrinkled posteriorly; sixth segment broad with two longitudinal elevations at middle and a small rounded lobe on either side of posterior margin sublaterally.

Under surface convex, thoracic pleura wrinkled, abdominal segments each with a small dull spot at middle and with a pair of dull, depressed spots on either side of sublateral sutures. Bases of ventral abdominal segments with pits and tubercles alternating across their entire width. *Genital lobes* very short, the terminal median lobe more prominent. Ventral plates strongly longitudinally wrinkled.

Color uniform brownish ferruginous, the eyes, apices of antennæ, and tarsi paler, testaceous.

Size: female, length 8 mm., width (abdomen) 4 mm.

Holotype, female, No. 5224, Calif. Acad. Sci., Ent., Angra, Estado Rio de Janeiro, Jussaral, October, 1935 (L. Travassos et Lopes).

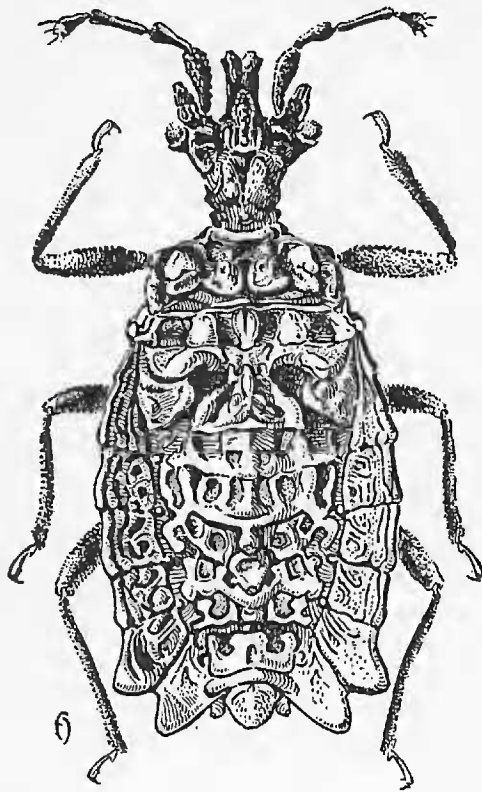


Figure 3. *Chelonoderus stylatus* Usinger, n. gen. and sp., male, holotype.

Chelonoderus Usinger, new genus

Apterous, elongate-oval in form, and clothed over most of the body with appressed, thick hairs. Head nearly as broad across eyes as long, 52::60, strongly narrowed behind the eyes into a slender neck region without postocular tubercles or spines. Anterior process comprising about one-third of total head length, narrowed at middle and feebly dilated apically with a small notch at middle of apex. Antenniferous tubercles long, divergent, sub-cylindrical, blunt at apex, reaching about to middle of first antennal segment. Eyes strongly exserted, suboval in form, located completely laterad of a line drawn from sides of antenniferous tubercles to sides of head at base. Antennæ slightly longer than head, the first segment thickest, curved outward, briefly surpassing apical process of head, second and third segments more slender, nearly cylindrical, fourth segment pyriform and pubescent apically.

Pronotum not quite one-fourth wider than head across eyes, the front margin depressed with a collar, sides strongly, roundly elevated, disk deeply pitted at middle with an irregular elevated lobe on either side of middle. Mesonotum wider, with a small lobe

above ostiolar opening, the disk depressed except for a large lobe on either side of middle and a median, longitudinally impressed elevation. Metanotum deeply, broadly impressed on either side of median elevation with the sides of oblique depressions lobulately produced and approximate at center. Third, fourth, and fifth connexival segments shallowly concave anteriorly and a little convex posteriorly, the sixth and seventh segments strongly lobed.

Stigmata located approximately at middle of ventral connexival plates on segments two to seven, those of eighth segment terminal. Trochanters distinct.

Genotype: *Chelonoderus stylatus* Usinger, n. sp.

Chelonoderus differs from the geographically neighboring species of *Chelonocoris* in its broad pronotum, well developed antenniferous tubercles, stylate eyes, and in the absence of a posterior prolongation of the mesonotum and posterior prolongations of the seventh abdominal segment. It is perhaps closest to the South American *Notoplocoris* but that genus lacks the dorsal pits and tubercles, has lateral metanotal lobes, and strongly produced styliform juga.

Chelonoderus stylatus Usinger, new species

Male. *Head* with upper surface roughly granular, tylus and paraclypeal lobes distinctly elevated, the disk of head with a deep pit on either side of this elevated area, the sides of pit extending as rounded tubercles toward each other at middle; constricted neck region about one-third as wide as head across eyes; juga subflattened, depressed, feebly dilated anteriorly, the apices broad and obliquely, shallowly emarginate, the entire apical process appearing feebly notched at middle because of divergent apices of juga. *Eyes* suboval in form, about one-seventh as wide as interocular space. *Antennæ* slightly longer than head, 67::60; proportion of segments one to four as 23:13:19:12. *Rostrum* about half as long as head, the rostral groove deep and completely enclosed.

Pronotum slightly broader than length of head, 64::60, about two and one-half times as broad as long on median line, 64::26; anterior margin depressed, forming a ring-like collar with a pair of rounded tubercles on each side opposing rounded tubercles from elevated pronotal disk, the apices of opening tubercles approximate; lateral pronotal margins greatly swollen, strongly elevated, sinuate on outer margins, with a longitudinal impression separating off an inner higher lobe; depressed central portion of disk with a prominent lobe on either side of middle separated by a

deep median longitudinal pit; posterior margin narrowly depressed beneath overhanging discal lobes, moderately sinuate. *Mesonotum* very short and broad, only half as long as pronotum and one-third wider across ostiolar lobes than width of pronotum; disk unevenly elevated laterally at ostiolar openings, broadly depressed sublaterally, with a large lobe on either side of middle entirely surrounded by a deep depression; each lobe projecting backward and nearly meeting a lobe extending across from central elevated area of metanotum; middle of mesonotum with a strongly elevated, longitudinally impressed, carina which broadens posteriorly into metanotum. *Metanotum* about as long as pronotum, enclosed by the connexivum from lateral margins; discal elevation highest along middle, depressed sublaterally on posterior half, the sides strongly elevated and dilated posteriorly, overhanging and approximating a corresponding lobe on lateral discal elevation with a deep, smooth, oblique depression on either side beneath and between the opposing lobes.

Abdominal disk moderately elevated medially, the first, second and third segments fused; fused area elevated anteriorly at middle, depressed laterally with tubercles as described above opposing those of metanotum over lateral depression; fused elevated area about as long as thorax, with a pair of oval or elongate oval depressions on either side of middle and with posterior portion narrowed to glandular opening at posterior margin. Fourth and fifth segments relatively short at middle and gradually decreasing in elevation to posterior margin of fifth segment. Sides of disk with two depressed areas on third segment, three on fourth and fifth, and two on sixth, with opposing tubercles between fourth and fifth and between fifth and sixth segments. Connexivum roughly sculptured, the first two segments fused, extending forward as a slender tip reaching ostiolar openings. Hind margins of second and third connexival segments, at least, elevated. Sixth and seventh connexival segments distinctly lobulate laterally, the seventh segment strongly elevated at middle. Lobes of eighth segment extremely short, reaching only to middle of genital lobe, this median lobe likewise comparatively short, subcordate, not reaching level of apices of lobes of seventh segment. Under surface rugose and impressed much as in related genera. Color rather uniform brown with the rostrum and tarsi somewhat paler.

Size: Male, length 11 mm., width (connexivum) $5\frac{1}{4}$ mm.

Holotype, male, No. 5225, Calif. Acad. Sci., Ent., N. Queensland, Australia, October 4, 1920, J. A. Kusche collector.